

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-101 (cancelled)

102. (new) A nucleic acid molecule encoding a pH sensitive mutant of GFP of Aequora victoria, wherein a change in pH results in an alteration in one or more spectral properties, including intensity, of the excitation and/or emission spectra of said GFP.
103. (new) The nucleic acid molecule according to claim 102, wherein amino acid residues of said GFP within at least one amino acid on either side of one or more amino acids selected from the group consisting of the amino acids at positions 94, 96, 148, 167, 203, 205 and 222, are altered.
104. (new) The nucleic acid molecule according to claim 102, wherein at least one substitution on said GFP is made at an amino acid position selected from the group consisting of positions 147, 149, 161, 163, 166, 167, 168, 175 and 202.
105. (new) The nucleic acid molecule according to claim 102, wherein said GFP comprises at least one of the mutations selected from the group consisting of S147E, S147P, N149V, N149Q, N149T, N149L, N149D, N149Y, N149W, T161I, K166Q, I167V, R168H, and S202H.

106. (new) The nucleic acid molecule according to claim 102, wherein said GFP comprises at least one mutation selected from the group consisting of S147D, N149Q, N149D, T161I, K166Q, I167V and S202H.
107. (new) The nucleic acid molecule according to claim 102, wherein said GFP comprises S147D, N149Q and T161I mutations.
108. (new) The nucleic acid molecule according to claim 107, wherein said GFP further comprises V163A and S175G mutations.
109. (new) The nucleic acid molecule according to claim 102, wherein said GFP comprises S147D, N149D, K166Q, I167V and S202H mutations.
110. (new) The nucleic acid molecule according to claim 109, wherein said GFP further comprises V163A and S175G mutations.
111. (new) The nucleic acid molecule according to claim 102, wherein an attenuation or loss of the excitation peak at 475 nm of said GFP and a loss of fluorescence intensity excitable at 395 nm of said GFP occurs upon a decrease of pH.
112. (new) The nucleic acid molecule according to claim 111, wherein said GFP is selected from the group consisting of 1D10, 2F10, 2H2, 1B11, 8F6, 8F3 and 19E1O.

113. (new) The nucleic acid molecule according to claim 102, wherein said GFP exhibits a decreased fluorescence due to excitation at the 395 nm peak and increased fluorescence due to increased excitation at the 475 nm peak in response to a decrease in pH.
114. (new) The nucleic acid molecule according to claim 113, wherein said GFP is selected from the group consisting of 14E12, 14C9, 14C8, 2G3, S202, H14D9, C6 and 8H8.
115. (new) The nucleic acid encoding a pH sensitive GFP according to claim 102, wherein said GFP is a part of a fusion protein comprising at least one other amino acid sequence.
116. (new) The nucleic acid according to claim 115, wherein said other amino acid sequence of the fusion protein targets the fusion protein to a cell.